

Howrey Docket No.02578.0006.CPUS01

REMARKS

Claims 1-65 are in the application. Claims 1, 23, 24, 40 and 41 are amended in this Response. Claims 64-65 are new.

As a preliminary manner, Applicant would like to thank the Examiner for the courtesies extended in the personal interview conducted on July 10, 2003. At the interview, Applicant asserted three distinctions over the combination of Ledger and the ImSpector cited by the Examiner as prior art: 1) focus on patterned films; 2) use of high resolution imaging spectrometer, i.e., capable of resolution of about 100 microns or less; and 3) two-step procedure for taking measurements in which measurement locations are located in the first step, and the measurements taken at these locations in the second step. Through this Response, the first two of these distinctions have been added to claims 1, 24, 40 and 41. All three of these distinctions are incorporated into claims 64 and 65.

As asserted at the interview, Applicant respectfully submits that each of these distinctions is alone sufficient to impart patentability to the claims over the Ledger/ImSpector prior art asserted by the Examiner.

Regarding the patterned film distinction, Figure 6 of Ledger confirms Ledger is concerned with homogenous films wholly unlike the patterned films to which the present invention is directed. At the interview, Applicant presented an example of a patterned film containing numerous detailed features. Applicant explained that the Ledger/ImSpector combination is not suitable for imaging patterned films inasmuch as it lacks the resolution required to image the detailed features involved.

Regarding the high resolution imaging spectrometer distinction, the ImSpector brochure, previously made of record in the application, confirms that the ImSpector involves an image size of 6.6 mm x 8.8 mm with a spatial resolution of 15 line-pairs/mm, which translates into only about 132 pixel resolution (8.8 mm x 15 line-pairs/mm). A resolution of 132 pixels applied to a standard 200 mm wafer implies only about a 1500 micron resolution (132 pixels/200 mm).

In sharp contrast to this, the imaging spectrometer of the subject invention provides at least 2048 pixels which, when applied to a standard 200 mm wafer, imply a resolution of about 100 microns (2048 pixels/200 mm). When applied to a 100 mm wafer, as discussed in the

Howrey Docket No.02578.0006.CPUS01

specification at page 16, lines 11-25, the 2048 pixels imply a resolution of about 50 microns (2048/100 mm). Page 16, lines 20-25, of the specification teaches side-by-side combinations of the 2048 imaging spectrometer, which yield even higher resolutions than 50 microns when applied to 200 mm and 100 mm wafers. Because of this higher resolution, the imaging spectrometer of the subject invention is capable of processing patterned films, while the ImSpector imager is not.

As explained at the interview, it was not a simple process for the inventors to develop an imaging spectrometer with the necessary resolution to handle patterned films. None were available commercially, and as indicated at page 10, lines 19-20, 24-25 of the specification, the inventors were required to adopt another approach. After consideration of the available options, the inventors counter-intuitively decided to modify a time delay/integration line scan camera to add an area mode (by disabling a row shifting feature). The non-obviousness of this approach is confirmed by the Hannes Declaration, previously submitted in the parent case, which establishes that there was a long-felt need (over 20 years) for an imaging spectrometer such as this, yet, prior to the subject invention, no one (as far as Applicant is aware) was able to develop an imaging spectrometer with the necessary resolution.

Regarding the distinction based on the two-step procedure, there is nothing in either Ledger or the ImSpector brochure which teaches or suggests this procedure. In fact, Col. 4, lines 45-47 of Ledger confirms that Ledger utilizes a light source which illuminates the "full aperture" of the wafer without the need for a translation mechanism. In avoiding the need for a translation mechanism, Ledger teaches away from this two-step procedure.

Each of these distinctions is amply supported in the specification. The patterned film distinction is supported throughout the specification at, e.g., Figure 5B and related text at page 11, line 21 – page 12, line 20. The high resolution imaging spectrometer distinction is supported in the specification at, e.g., page 10, lines 17-28; page 16, lines 11-30; and page 17, lines 10-16. The two-step procedure distinction is amply supported in the specification at, e.g., Figure 5A and related text at page 11, line 21 – page 12, line 20.

The patterned film and high resolution imaging spectrometer distinctions are recited in independent claims 1, 24, 40 and 41, and incorporated into dependent claims 2-23, 25-39, and 42-63 through their direct or indirect dependence on claims 1, 24, 40 and 41. The patterned film,

Howrey Docket No.02578.0006.CPUS01

high resolution imaging spectrometer, and two-step procedure distinctions are recited in independent claims 64-65. Neither of these distinctions are taught or disclosed in the Ledger/ImSpector combination asserted as prior art by the Examiner. Therefore, it is respectfully submitted that each of these claims is patentable over this asserted art.

For all the foregoing reasons, the Examiner is earnestly solicited to allow all claims and pass this application to issuance. Authorization to charge our deposit account for the excess claims fee associated with new claims 64-65 is provided in the attached transmittal sheet. Authorization to charge our deposit account for the one-month extension fee is provided in the attached petition for one-month extension. Applicant believes no additional fees are due in connection with this Response. However, if any additional fees are in fact due, the Commissioner is hereby authorized to charge the same to Howrey Deposit Account No. 08-3038, referencing Howrey Dkt. No. 02578.0006.CPUS01.

Respectfully submitted,

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